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VALVE MECHANISM

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Fig. 1.

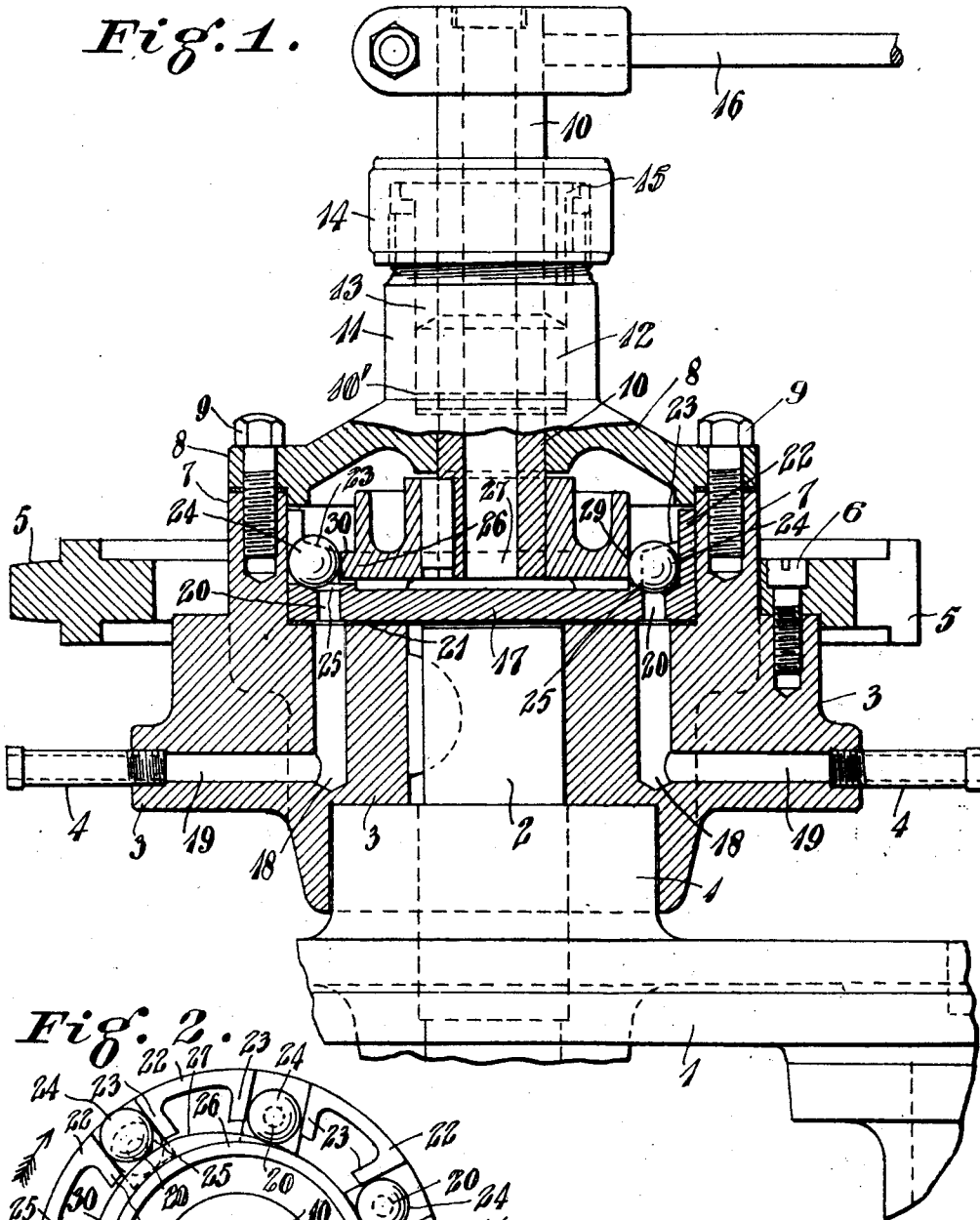
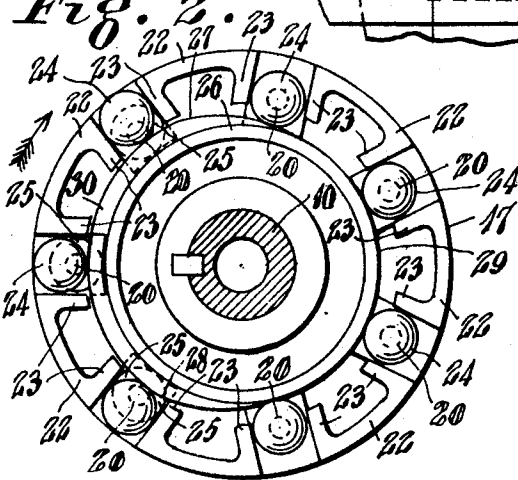


Fig. 2



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VALVE MECHANISM.

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My invention relates to valves for intermittent opening incident to the motion of part of some apparatus in which they operate, as for example a bottle washing or rinsing machine in which the bottles are for only part of the cycle of operation supplied with the washing liquid, the rest of the time the liquid being shut off from the bottle, for applying the bottles to and taking them from the machine. The object of my invention is to simplify and reduce the cost of such apparatus, as well as make it less liable to derangement. Other minor objects will appear in the course of the following description.

I attain these objects by the device illustrated, for example, in the accompanying drawing, in which—

Figure 1 is a vertical sectional view of part of a rotary rinsing machine in which my invention is incorporated; and

Fig. 2 is a plan view of the valve-seat disk, the valve balls, and the cam and its supporting means, to actuate the balls.

The rinsing machine comprises a suitable support or base 1, having an upstanding stud 2 on which rotates the head 3 having spouts 4 extending radially from it. As a complete disclosure of the construction and mode of operation of such a rinsing machine is not necessary in order to fully disclose my present invention, it is sufficient to say that these spouts, in their outer parts, are so provided as to direct streams of water into bottles carried by a suitable conveying means operating in conjunction with the rotation of the head 3 through the medium of the sprocket or gear wheel 5 which surrounds and is fixed to the head 3 by screws 6, one of which is shown. These details are mentioned merely to elucidate one example to which my invention is applicable, and it will be understood that such a head as the head 3 may have other uses, or be otherwise rotated in conjunction with other uses, and the spouts or other outlets therefrom may be adapted for other uses, with different arrangement and in conjunction with details other than would be found on a rinsing machine of the kind herein partly illustrated.

The head 3 has its upper part formed with a rim 7 so that it is cup shaped; and onto this rim 7 the cover 8 is secured by bolts 9, so that a valve chamber is thus enclosed. This cover 8 has, concentric with the axis

of rotation of the head and cover, an opening through which the supply tube 10 extends down into the chamber; and a stuffing box 11 is formed on the top of the cover around this tube, with packing 12 compressed between an annular rib 10' on the tube 10 and a gland 13 held by a cap 14 screwed on the box 11. Preferably the gland 13 is held by a key 15 to the box 11 so as to turn with the latter, and prevent loosening of the cap 14. The tube 10 has a bar 16 clamped to its upper part, above the stuffing box, and this bar will be understood to engage with some stationary part of the machine, so that the tube 10 is prevented from turning with the head 3 and cap or cover 8. Also, it will be understood that the upper end of the tube 10 is connected with a suitable source of supply for water, to flow or be forced down through the tube 10 into the chamber.

Inside this chamber the valve seat disk 17 fits snugly within the rim 7 of the head 3; the latter having upright ports 18 leading from the bottom of the chamber to the respective spouts 4 through lower radial ports 19 in the head, and this disk 17 having ports 20 down through it, coinciding with the respective head ports 18. A gasket 21 is interposed between the disk 17 and the bottom of the chamber to prevent leakage at the connection of the disk ports 20 with the head ports 18. Alternating between the disk ports 20, the disk has upstanding rim segments 22, each with radially inwardly projected guide lugs 23 adjacent to the disk ports 20. These confine and guide the valve balls 24 which seat on the shallow conical seats 25 provided around the disk ports 20.

The inlet tube 10 extends to within a short distance of the top of the valve seat disk 17 and has keyed on its the cam 26 having its periphery concentric with the axis of rotation of the head 3 on one radius for part of its extent and on a somewhat greater radius for another part of its extent; these portions of different radius being joined by eccentric portions 27 and 28. The less extended portion 29 of the cam 26 is such as to allow the balls to occupy their seats 25, but the more extended portion 30 is such as to push these balls 24 radially outward between the guide lugs 23, up off of their seats 25, so that the liquid may flow from the tube 10 through the ports 20, 18 and 19 to the

various spouts 4. As the head 3 rotates and the tube 10 and cam 26 are held stationary, the cam portion 27 as it engages each ball 24, gradually unseats the ball as above described, and the portion 30 holds the ball unseated while passing it, until, the other eccentric portion 28 coming to the ball, allows it to gradually roll back onto its seat. When on their seats, the balls 24 are held down thereto by the pressure of the liquid in the chamber; and the instant the portion 28 allows the valve ball 24 thus to reach its seat completely, the pressure tightly clamps the ball to the seat 25.

Modifications may occur in the adaptation of my invention to other machines than the one I have chosen for an example; for instance the head, with the valve balls, might remain stationary, with the cam rotating, under some conditions of use; and other modifications may occur. Therefore, I do not wish to be understood as being limited to the specific disclosure herein, but what I claim as new and desire to secure by Letters Patent is:

1. In a valve mechanism, a seat element and a cam relatively rotatable about the

same axis, said element having an opening with a valve seat in a plane perpendicular to the axis of rotation and having a chamber enclosing said seat and said cam, with an inlet concentric with the axis of rotation, and a valve element seating on said seat, or unseated therefrom by said cam incident to the relative rotation.

2. In a valve mechanism, a rotary valve chamber having an outlet with a valve seat, a non-rotary tube opening into said chamber concentric with the axis of rotation, a variable-radius cam fixed on said tube in said chamber, and a valve element seating on said seat, or unseated therefrom by said cam incident to rotation of said valve chamber.

3. In a valve mechanism, a rotary valve chamber having a circular series of outlets with valve seats, a non-rotary tube opening into said chamber concentric with the axis of rotation, a variable-radius cam fixed on said tube in said chamber, and valve elements seating on the respective seats, or unseated therefrom by said cam incident to the rotation.

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